AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the Application. No new matter has been introduced by way of the claim amendments. Current additions to the claims are noted with underlined text. Current deletions from the claims are indicated by text ~~strikethrough~~ or [[double bracketing]]. The status of each claim is indicated in parenthetical expression following the claim number.

WHAT IS CLAIMED IS:

1. (Currently Amended) A method comprising:

a) providing functionalized carbon nanotubes,

wherein the functionalized carbon nanotubes are selected from the group consisting of:

(i) aryl halide functionalized carbon nanotubes, ~~and~~

wherein the aryl halide comprises a halide selected from the group consisting of chlorine, bromine, iodine, and combinations thereof, and

(ii) carbon nanotubes comprising nucleation sites operable for initiating a polymerization reaction after deprotonation of said nucleation sites to form initiator groups,

wherein the polymerization reaction is selected from the group consisting of anionic polymerization and ring opening polymerization;

b) dispersing the functionalized carbon nanotubes in a solvent;

c) adding to the solvent at least one reagent selected from the group consisting of:

(i) an alkyllithium species,

(ii) a metal, and

(iii) a deprotonating agent,

wherein the at least one reagent reacts with the functionalized carbon nanotubes to form a polymerizable species on the carbon nanotubes;

wherein the polymerizable species is selected from the group consisting of an aryl-lithium species comprising aryl-lithium bonds, an aryl-metal species comprising aryl-metal bonds, and initiator groups;

wherein deprotonation of the nucleation sites forms the initiator groups;

d) adding a monomer to the solvent; and

e) initiating a polymerization reaction between the monomer and the polymerizable species on the carbon nanotubes to form a polymer-carbon nanotube material,

wherein a polymer comprising the polymer-carbon nanotube material is covalently bound to the carbon nanotubes; and

wherein the polymerization reaction is selected from the group consisting of anionic polymerization and ring opening polymerization.

2. (Currently Amended) A method comprising:

a) providing aryl halide functionalized carbon nanotubes;

wherein the aryl halide comprises a halide selected from the group consisting of chlorine, bromine, iodine, and combinations thereof;

b) dispersing the aryl halide functionalized carbon nanotubes in a solvent;

c) adding an alkyllithium species to the solvent,

wherein the alkyllithium species reacts with the aryl halide functionalized carbon nanotubes to form an aryl-lithium species;

wherein the aryl-lithium species comprises a polymerizable species on the carbon nanotubes; and

wherein the polymerizable species comprises~~ing~~ aryl-lithium covalent bonds;

d) adding a monomer to the solvent; and

e) initiating a polymerization reaction between the monomer and the polymerizable ~~aryl-lithium~~ species to form a polymer-carbon nanotube material,

wherein a polymer comprising the polymer-carbon nanotube material is covalently bound to the carbon nanotubes; and

wherein the polymerization reaction is selected from the group consisting of anionic polymerization and ring opening polymerization.

3. (Currently Amended) A method comprising:

a) providing aryl halide functionalized carbon nanotubes;

wherein the aryl halide comprises a halide selected from the group consisting of chlorine, bromine, iodine, and combinations thereof;

b) dispersing the aryl halide functionalized carbon nanotubes in a solvent;

c) adding a metal to the solvent,

wherein the metal reacts with the aryl halide functionalized carbon nanotubes to form an aryl-metal species;

wherein the aryl-metal species comprises a polymerizable species on the carbon nanotubes; and

wherein the polymerizable species comprises~~ing~~ aryl-metal covalent bonds;

d) adding a monomer to the solvent; and

e) initiating a polymerization reaction between the monomer and the polymerizable ~~aryl-metal~~ species to form a polymer-carbon nanotube material,

wherein a polymer comprising the polymer-carbon nanotube material is covalently bound to the carbon nanotubes; and

wherein the polymerization reaction is selected from the group consisting of anionic polymerization and ring opening polymerization.

4. (Previously Amended) The method of Claim 3, wherein the metal is selected from the group consisting of zinc, nickel, potassium, sodium, lithium, magnesium, cesium, palladium, and combinations thereof.

5. (Previously Amended) The method of Claim 3, wherein the metal is Mg,

wherein the aryl-metal bonds are aryl-Mg bonds comprising a Grignard species.

6. (Previously Amended) The method of any one of Claims 1 – 5, wherein the aryl halides are bonded to the sidewall of the aryl halide functionalized carbon nanotubes.

7. (Cancelled)

8. (Previously Amended) The method of any one of Claims 1 – 5, wherein the aryl halide is an aryl bromide.

9. (Previously Amended) The method of any one of Claims 1 or 2, wherein the alkyllithium species is n-butyllithium.

10. (Currently Amended) A method comprising:

a) providing functionalized carbon nanotubes,

wherein the functionalized carbon nanotubes comprise nucleation sites operable for initiating a polymerization reaction after deprotonation of said nucleation sites to form initiator groups;

wherein the polymerization reaction is selected from the group consisting of anionic polymerization and ring opening polymerization;

b) dispersing the functionalized carbon nanotubes in a solvent;

c) adding a deprotonating agent to the solvent,

wherein the deprotonating agent deprotonates the nucleation sites to form initiator groups operable for initiating the polymerization reaction;

d) adding a monomer to the solvent; and

e) initiating a polymerization reaction between the monomer and the initiator groups to form a polymer-carbon nanotube material,

wherein a polymer comprising the polymer-carbon nanotube material is covalently bound to the carbon nanotubes; and

wherein the polymerization reaction is selected from the group consisting of anionic polymerization and ring opening polymerization.

11. (Previously Amended) The method of Claim 10, wherein the nucleation sites comprise at least one element selected from the group consisting of carbon, sulfur, oxygen, and nitrogen.

12. (Original) The method of Claim 10, wherein the functionalized carbon nanotubes are selected from the group consisting of phenol functionalized carbon nanotubes, thiophenol

functionalized carbon nanotubes, phenethyl alcohol functionalized nanotubes (CNT-C_6H_4-CH_2CH_2OH), CNT-C_6H_4-NHBoc, and combinations thereof.

13. (Previously Amended) The method of any one of Claims 10 – 12, wherein the nucleation sites are on the sidewall of the functionalized carbon nanotubes.

14. (Previously Amended) The method of any one of Claims 10 – 12, wherein the deprotonating agent comprises a base.

15. (Original) The method of Claim 14, wherein the base is selected from the group consisting of KOH, KH, NaOH, NaH, and potassium hexamethyldisilazide.

16. (Previously Amended) The method of any one of Claims 10 – 12, wherein the deprotonating agent comprises a metal operable for deprotonating the nucleation sites.

17. (Original) The method of Claim 16, wherein the metal is selected from the group consisting of zinc, nickel, potassium, sodium, lithium, magnesium, cesium, palladium, and combinations thereof.

18. (Previously Amended) The method of any one of Claims 1 – 5 or 10 – 12, wherein the initiating step comprises initiating anionic polymerization.

19. (Previously Amended) The method of any one of Claims 1 – 5 or 10 – 12, wherein the initiating step comprises initiating ring opening polymerization.

20. (Previously Amended) The method of any one of Claims 1 – 5 or 10 – 12, wherein the functionalized carbon nanotubes are single-wall carbon nanotubes.

21. (Previously Amended) The method of any one of Claims 2 – 5 or 10 – 12, wherein the solvent is tetrahydrofuran.

22. (Previously Amended) The method of any one of Claims 2 – 5 or 10 – 12, wherein the monomer is selected from the group consisting of styrene, acrylates, methyl acrylates,

vinyl acetate, vinyl pyridines, isoprene, butadiene, chloroprene, acrylonitrile, maleic anhydride, and combinations thereof.

23. (Previously Amended) The method of any one of Claims 2 – 5 or 10 – 12, wherein the monomer comprises styrene.

24. (Previously Amended) The method of any one of Claims 2 – 5 or 10 – 12, further comprising adding a terminating agent suitable for terminating the polymerization reaction.

25. (Original) The method of Claim 24, wherein the terminating agent is selected from the group consisting of ethanol, acetaldehyde, trimethylsilyl chloride, and combinations thereof.

26. (Original) The method of Claim 24, wherein the terminating agent is ethanol.

27. (Previously Amended) The method of any one of Claims 1 – 5 or 10 – 12, wherein a concentration of the monomer is between about 0.03 and about 0.16 g/ml.

28. (Previously Amended) The method of any one of Claims 1 – 5 or 10 – 12, wherein the initiating step occurs at a temperature between about 0°C and about 50°C.

29. (Cancelled)

30. (Cancelled)

31. (Previously Amended) The method of any one of Claims 1 – 5 or 10 – 12, further comprising adding a polymerization catalyst to the solvent.

32. (Previously Amended) The method of Claim 31, wherein the polymerization catalyst comprises $TiCl_4$.

33. (Previously Amended) The method of any one of Claims 1 – 5 or 10 – 12, further comprising a step of utilizing the polymer-carbon nanotube material in a drug delivery process.

34. (Previously Amended) The method of any one of Claims 1 – 5 or 10 – 12, further comprising a step of utilizing the polymer-carbon nanotube material for scaffolding to promote cellular tissue growth.